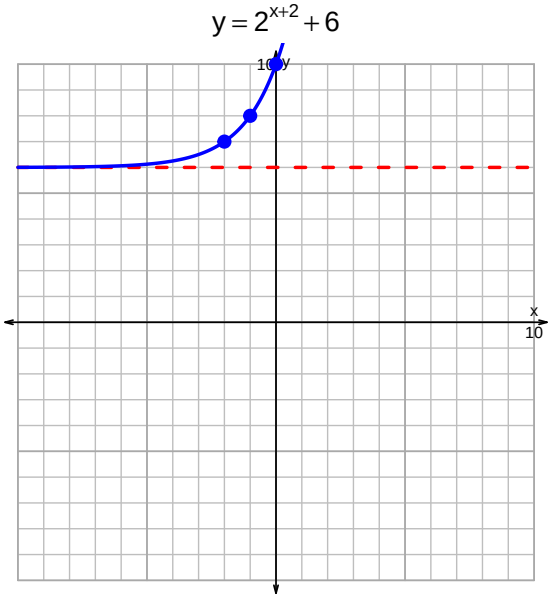
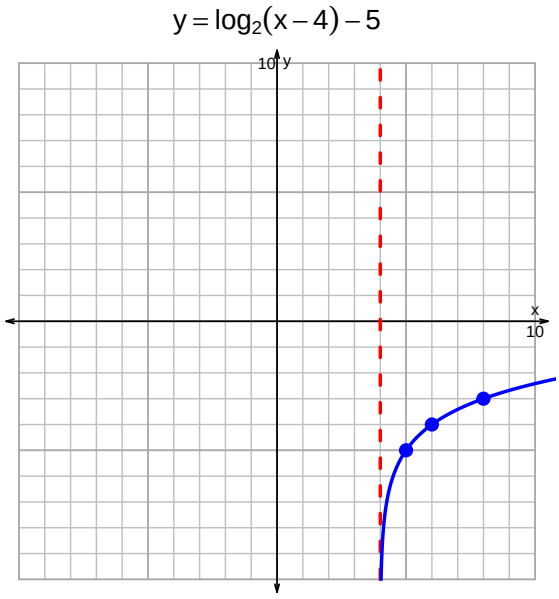
Name: Date:

s18: EXP LOG (SLTN v360)

1. (10 pts) Graph $y = 2^{x+2} + 6$ and $y = \log_2(x-4) - 5$ on the grids below. Also, draw any asymptotes with dashed lines.





Somewhat useful hint: $2^3 = 8$, *and thus* $\log_2(8) = 3$.

2. (10 pts) Write (but do not evaluate) the solution to the equation below by writing a logarithmic expression. Please do not do any arithmetic; just move numbers around.

$$-17 = \left(\frac{-3}{4}\right) \cdot 10^{-5t/7}$$

Divide both sides by $\frac{-3}{4}$.

$$\frac{17 \cdot 4}{3} = 10^{-5t/7}$$

Take log, base 10, of both sides.

$$\log_{10}\left(\frac{17 \cdot 4}{3}\right) = \frac{-5t}{7}$$

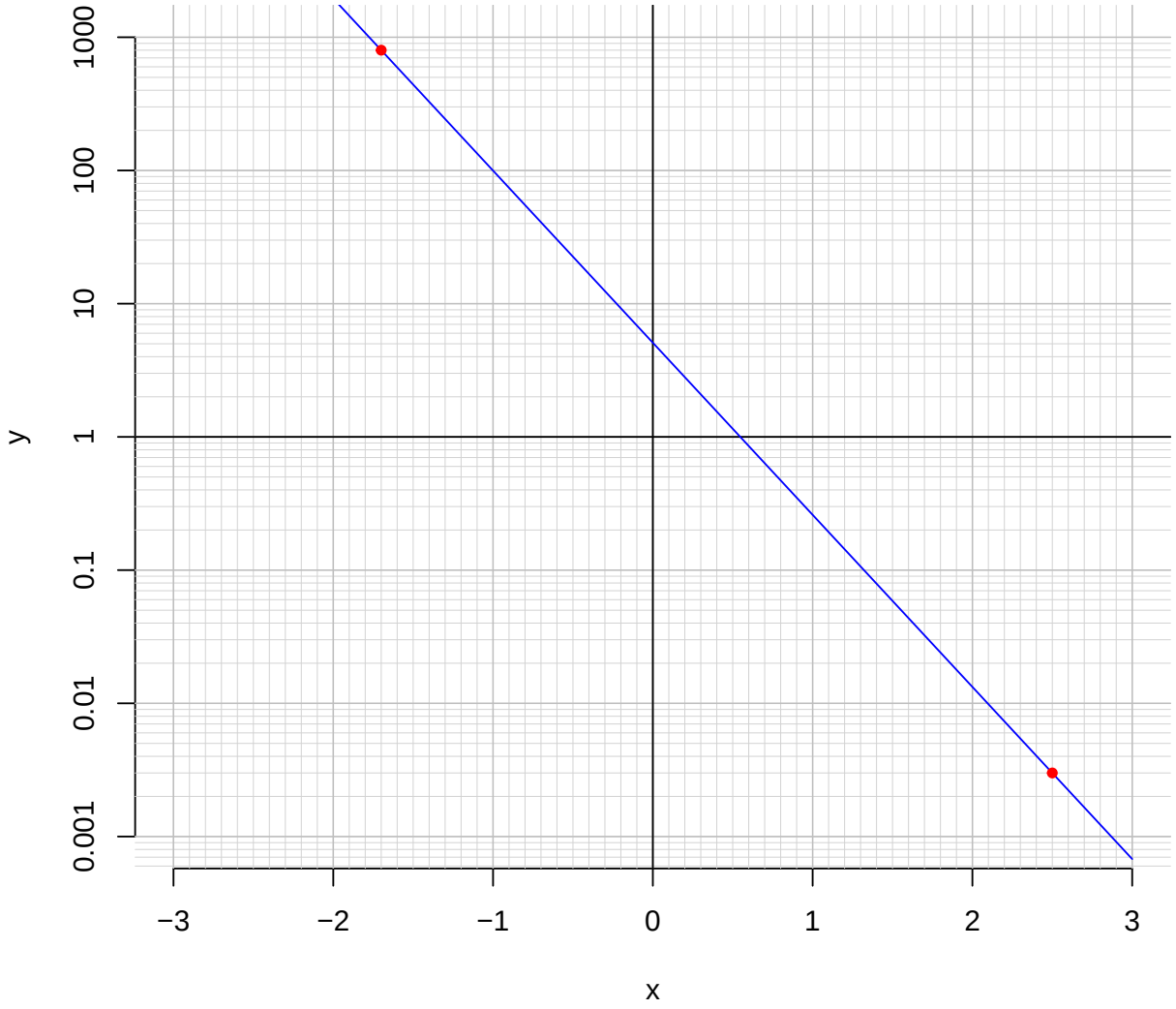
Divide both sides by $\frac{-5}{7}$.

$$\frac{-7}{5} \cdot \log_{10}\left(\frac{17 \cdot 4}{3}\right) = t$$

Switch sides.

$$t = \frac{-7}{5} \cdot \log_{10}\left(\frac{17 \cdot 4}{3}\right)$$

3. (10 pts) An exponential function $f(x) = 5.09 \cdot e^{-2.97x}$ is graphed below on a semi-log plot.



a. Using the plot above, evaluate $f(2.5)$.

$$f(2.5) = 0.003$$

b. The inverse function is logarithmic.

$$f^{-1}(x) = \frac{-1}{2.97} \cdot \ln\left(\frac{x}{5.09}\right)$$

Using the plot above, evaluate $f^{-1}(800)$.

$$f^{-1}(800) = -1.7$$